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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/776,472

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Daniel James Branagan

NANO004U

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7590

08/06/2009

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EXAMINER

ZHENG, LOIS L

ART UNIT

PAPER NUMBER

1793

MAIL DATE

DELIVERY MODE

08/06/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/776,472	Applicant(s) BRANAGAN, DANIEL JAMES	
	Examiner LOIS ZHENG	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6,7 and 11-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6,7 and 11-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Claims

1. No claim amendments are made in view of applicant's response filed 22 April 2009. Therefore, claims 6-7 and 11-16 are currently under examination.

Claim Interpretation

2. Regarding claims 6 and 11, since no specific order is required for executing processing steps, the examiner is interpreting that the sequence of the claimed processing steps can take place in any order. In addition, since processing steps recite the same iron based metallic coating alloy and the metal surface is relatively clean(i.e. the cleaned surface may still contain oxides) with the application of the iron based metallic coating alloy, the examiner is interpreting that the claimed processing step of applying the liquid metal of the iron based alloy to an oxidized metal surface to provide a clean metal surface and the claimed processing step of applying an iron based metallic coating alloy to the clean metal surface may take place simultaneously(i.e. these two processing steps are the same coating application step) based on the broadest reasonable interpretation.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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4. Claims 6-7 and 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dorfman US 4,822,415(Dorfman), and further in view of Branagan et al. US 6,125,912 (Branagan).

The rejection of the instant claims is maintained for the same reasons set forth in paragraph 5 of the Non-Final Office Action mailed 22 December 2008.

Response to Arguments

5. Applicant's arguments filed 22 April 2009 have been fully considered but they are not persuasive.

In the remarks, applicant argues that Dorfman uses flame spraying to produce a coating up to 1.3mm thick and does not teach the claimed high velocity oxy-fuel(HVOF) system.

The examiner does not find applicant's argument convincing because applicant's argument regarding Dorfman attacks the Dorfman reference alone while the rejection ground is based on the combination of Dorfman in view of Branagan, wherein Branagan is incorporated into the rejection ground to teach the claimed high velocity oxy-fuel (HVOF) thermal spraying technique. The applicant is reminded that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); In re Merck & Co., Inc., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). See MPEP 2145 (IV).

Applicant further argues that Dorfman in view of Branagan would not lead a skilled artisan to use manganese in a HVOF system because manganese is optional in Dorfman.

Although manganese is an optional element in Dorfman, Dorfman does teach that the presence of optional elements such as manganese in an amount of less than 15% improves corrosion resistance and ductility(col. 4 lines 6-9). One of ordinary skill in the art would have found it desirable to include manganese in an iron based alloy coating of Dorfman in view of Branagan in order to improve corrosion resistance and ductility. Therefore, the examiner does not find applicant's argument convincing.

Applicant further argues that Dorfman in view of Branagan do not teach an HVOF coating containing Mn at a thickness of 40-110 Mils that provides a bond strength of at least about 12,000 psi.

Dorfman in view of Branagan teach a process of forming a metallic coating that is substantially the same as claimed process(i.e. using substantially the same metallic coating composition and the same high velocity oxy-fuel spraying technique). Therefore, one of ordinary skill in the art would have expected the bonding strength of the resulting coating layer by the process of Dorfman in view of Branagan to be substantially the same as claimed within the claimed coating thickness. Therefore, the examiner does not find applicant's argument convincing.

Applicant further argues that remarkable results and extremely effective metallurgical bond are obtained with claimed process, which is reflected by the bond strength results from ASTM C633 testing method.

Applicant's argument appears to be directed to superior or unexpected results, which must be factually supported by an appropriate affidavit or declaration to be of probative value. See *In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984) and MPEP 716.01(c). Evidence of unexpected properties may be in the form of a direct or indirect comparison of the claimed invention with the closest prior art which is commensurate in scope with the claims. See *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) and MPEP § 716.02(d) - § 716.02(e). Since the proof of factual evidence is lacking, the examiner does not find applicant's argument persuasive.

Applicant further argues that Dorfman does not teach HVOF coatings, and Branagan teaches thinner coating thickness and does not teach using manganese. Neither Dorfman nor Branagan teaches a HVOF coating at 40-110 mils with bonding strengths of at least 12,000psi.

The rejection ground is based on the combination of Dorfman in view of Branagan. As set forth above, Dorfman in view of Branagan teach a process of forming a metallic coating that is substantially the same as claimed process(i.e. using substantially the same metallic coating composition and the same high velocity oxy-fuel spraying technique). Therefore, one of ordinary skill in the art would have expected the bonding strength of the resulting coating layer by the process of Dorfman in view of Branagan to be substantially the same as claimed within the claimed coating thickness. Therefore, the examiner does not find applicant's argument convincing.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kim et al. US 5,643,531 teaches a ferrous alloy coating composition comprising 1.0-3.2wt% of Mn and uses suitable thermal spraying techniques such as HVOF and plasma spraying to produce a coating with thickness of 20µm to 5mm.

Surface Hardening of Steels, page 8, Table 4, shows that HVOF coating process produces a ferrous coating with higher bond strength than plasma spraying process.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LOIS ZHENG whose telephone number is (571)272-1248. The examiner can normally be reached on 8:30am - 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

LLZ